

A2 **Munson Medical Center's Cardiovascular Services Achieves Top 100 National Recognition**

Munson is the only hospital in northern lower Michigan to receive the award for clinical quality, performance, and operational efficiency.

A3 **Welcome to the Munson Heart Center**

Cardiovascular services are moving to one convenient location with 98 new cardiac beds.

A4 **Munson Medical Center Introduces Innovative Cardiac Procedures**

Two new therapeutic options for patients with heart disease dramatically improve quality of life.

A5 **Munson Medical Center Offers Advanced Electrophysiology Procedures**

Cardiac arrhythmias are evaluated and treated with an arsenal of innovative therapeutic techniques.

> **Munson's Top 100 Cardiac Program Expands, New Heart Center Opens**

Images Featured Above:

- A and B: Initial TEE
- C: Detailed Analysis
- D: Cadaver Study
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A6 **Munson Medical Center Promotes New Approaches to Cardiac Surgical Care**

Surgical quality initiative becomes national prototype for linking outcomes data to improvement opportunities.

A7 **Munson Medical Center's Cardiothoracic Surgery Volumes/Outcomes**

MMC's risk adjusted mortality and complication rates far better than national averages.

Cardiovascular Services Achieves Top 100 National Recognition

Munson Medical Center (MMC) has been recognized by Solucient, a national health care and information services organization, as a *Top 100 Hospital* in the category Cardiovascular Benchmarks for Success. **Munson is the only hospital in northern lower Michigan to receive the award.** Munson also received this recognition in 1999, 2000, and 2001.

Solucient evaluated 844 hospitals nationally, using publicly available 2004 and 2005 Medicare data and 2005 Medicare cost reports. It ranked hospitals based on eight measures of clinical quality, performance, and operational efficiency, including risk-adjusted AMI and CHF patient mortality index, risk-adjusted PCI and CABG patient mortality index, risk-adjusted complication index, core measure score, percentage of CABG patients with Internal Mammary Artery use, procedure volume, severity-adjusted average length of stay, and severity- and wage-adjusted cost per case.

“This national recognition affirms that Munson is providing state-of-the-art cardiovascular service,” said **Kevin Clayton, DO**, medical staff Chair of Cardiology at Munson. He noted that cardiology medical staff regularly review patient outcomes to ensure high quality care. “We measure ourselves against local benchmarks as well as nationally-defined core measures

– standardized performance measures that have been demonstrated to correlate with better health outcomes.”


Mark Anthony, MMC Senior Vice President, said, “Physicians in northern Michigan can be confident that their patients are not only getting top-quality care at Munson, but they are also getting cost-effective care. That was one of the conclusions of Solucient’s review.”

MMC was among 40 hospitals recognized nationally in the category of teaching hospitals without cardiovascular residencies. Solucient also recognized 30 hospitals with cardiovascular residencies and 30 community hospitals.

Heart surgeon **Daniel H. Drake, MD**, noted, “Munson has a long track record of excelling in the fields of catheter-based and surgical cardiac interventions. We are proud to be a part of Munson’s cardiovascular program and will continue to press forward as new technologies and new opportunities for clinical improvement arise.”

MMC has partnerships with Grand Traverse Heart Associates, Great Lakes Cardiology, and Cardiothoracic Surgeons of Grand Traverse. The physicians provide services for patients in various locations.



 MMC Cardiologist Roberto Corpus, MD, performs a cardiac catheterization procedure in one of Munson’s three cath labs.

“By meeting or exceeding these measures, we are saving lives. That is the most eye-opening part of Solucient’s study. This award is a direct result of the cardiovascular team’s commitment to deliver the highest quality care. Physicians in northern Michigan again are reminded that their patients will receive top-notch cardiac care at Munson Medical Center.”

– Mack Stirling, MD
MMC Cardiothoracic Surgeon

Welcome to the Munson Heart Center

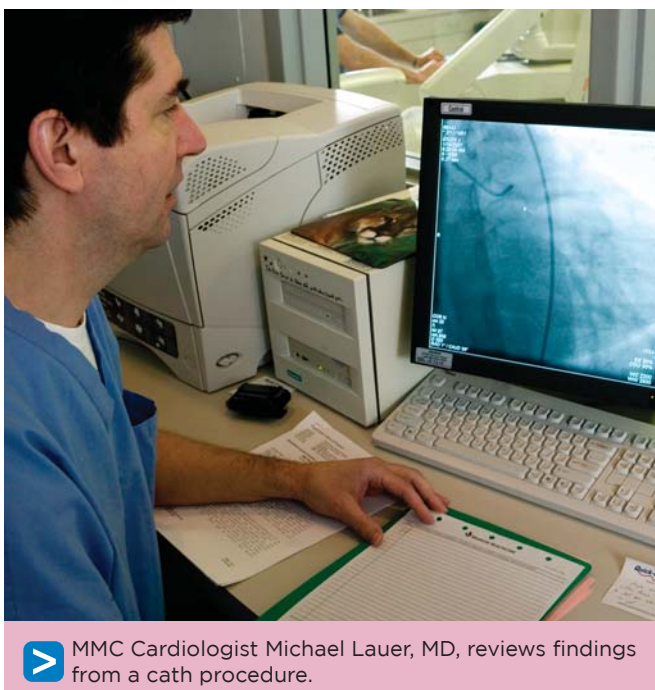
Munson's addition of 98 new cardiac beds emphasizes commitment

Over the coming eighteen months, all of Munson Medical Center's (MMC) cardiovascular services will move to one convenient location in the Munson Heart Center. This move represents the culmination of several years of careful planning and heralds a new collaborative approach to cardiac care. The Munson Heart Center will be a state-of-the-art facility offering the highest quality of cardiovascular care, as well as a healing environment for patients and their families.

The Center will include a 30-bed cardiothoracic surgery unit and a 30-bed cardiology unit providing intensive care and post-interventional care. Both units will feature acuity-adjusted care rooms. On these units, patients will remain in their private room, receiving the appropriate

level of care as their needs change throughout their hospitalization. Studies have demonstrated that acuity-adjusted care reduces medication errors by 70 percent, reduces patient falls, and improves overall patient satisfaction. These rooms will also feature patient and family amenities, including a family area with sleeping accommodations, desk, television, and internet access.

The Munson Heart Center will include a 38-bed medical cardiology unit specializing in heart failure, noninvasive cardiology services, and three catheterization and two electrophysiology laboratories, with 24 adjacent recovery beds. This floor can accommodate two more labs in the future.



> MMC Cardiologist Michael Lauer, MD, reviews findings from a cath procedure.

"We are all eagerly anticipating our move into the Munson Heart Center. The expansion and consolidation of cardiovascular services will promote an interdisciplinary approach to care that will surely benefit our patients and will position Munson as Michigan's premier heart center."

– Mark S. Smith, MD
MMC Cardiologist

Munson Introduces Innovative Cardiac Procedures

Munson Medical Center (MMC) is expanding its repertoire of cardiovascular services with the addition of two innovative procedures – enhanced external counterpulsation (EECP) and ultrafiltration – that offer new therapeutic options for patients with heart disease and limited treatment choices.

EECP: A New Revascularization Option



Dino Recchia, MD, Director of Cardiac Rehabilitation and Prevention at MMC, said, “EECP may be a good therapeutic option for patients with disabling angina that limits their life style choices, who have failed medical therapy, and who are not candidates for coronary interventions, bypass surgery, or other revascularization approaches.”

“In our practice, virtually all patients have improved with EECP. More than half have a marked decrease in angina symptoms, and many are able to reduce or even stop their cardiac medications.”

– Dino Recchia, MD
MMC Director of Cardiac
Rehabilitation
and Prevention

EECP works by augmenting blood flow through the coronary arteries, which in turn accelerates the development of collateral circulation. Patients lie on the treatment table, and compressive cuffs are wrapped around the calves, thighs, and buttocks. The cuffs inflate in a distal to proximal sequence in early diastole and deflate simultaneously in late diastole just prior to the onset of systole. Inflation and deflation are specifically timed to the patient’s EKG. The sequential cuff inflation creates a retrograde pressure wave that augments diastolic pressure, increasing coronary perfusion pressure and venous return to the right heart. Rapid, simultaneous cuff deflation decreases systemic vascular resistance, afterload, and cardiac workload.

Clinical studies and data from the International EECP Patient Registry show that 70 to 80 percent of patients realize therapeutic benefits immediately upon completion of a course of EECP therapy. Therapeutic benefit is enhanced at six months and sustained at 24 months post treatment. Quality-of-life measurements show significant improvement in the patients’ ability to resume activities of daily living, social interaction, and recreation.

EECP is provided on an outpatient basis at Munson Community Health Center in hourly sessions, five days per week, over a period of seven weeks. Recchia noted, “It is important for physicians and their patients to understand that EECP is a time-intensive therapy. For that reason, we are actively looking into opportunities to extend this service to some of our affiliated hospitals so that more patients can take advantage of this life-improving therapy.”

Ultrafiltration: A New Approach to Treating Cardiorenal Syndrome

Ultrafiltration is a new therapeutic approach for patients with heart failure in the setting of cardiorenal syndrome. Recchia said, “These patients are very difficult to manage. They have significant volume overload, not enough that they require dialysis, but enough that they cannot be adequately diuresed with medical therapy. Ultrafiltration is a way to unload excessive fluid without damaging the kidneys.”

Ultrafiltration devices mechanically remove up to 500 ml of fluid per hour through a central line or through small cannulae placed in a brachial vein. Ultrafiltration may be used over a period of one to several days to re-establish volume control, after which patients generally can be managed with standard oral diuretics.

Unlike standard diuretic therapy, in which the physician cannot control the rate and duration of fluid removal, ultrafiltration allows the physician to titrate these variables to meet the needs of each individual patient.

Initially, Munson physicians are offering ultrafiltration in the intensive care unit for hospitalized patients. However, they are considering offering it on an observation basis for patients who do not need to be admitted to the hospital for other reasons.

Munson Offers Advanced Electrophysiology Procedures

Physicians in Munson Medical Center's (MMC) Electrophysiology Laboratory offer state-of-the-art procedures, including diagnostic studies, percutaneous ablation, cardiac resynchronization, device placement, and laser lead extraction, to evaluate and treat cardiac arrhythmias. They have recently added a new therapy – catheter ablation of atrial fibrillation – to their therapeutic armamentarium.

Catheter Treatment of PSVTs

Catheter ablation of arrhythmia-causing foci in the heart is an effective and relatively less invasive strategy for correcting paroxysmal supraventricular tachycardias (PSVTs), including AVRT, AVNRT, and atrial flutter.

Brian Jaffe, MD, a Cardiologist at MMC, said, “I believe catheter ablation should be more commonly considered as a first-line therapy for PSVT patients. The success rate for catheter ablation of PSVT is very high, and the risk profile is very small.”

Catheter Ablation for Atrial Fibrillation

Jaffe also has recently begun offering catheter ablation of atrial fibrillation for carefully selected patients. He says appropriate candidates for this procedure have symptomatic atrial fibrillation that adversely affects their quality of life, have failed several trials of antiarrhythmia drugs, and are willing to undergo a moderately risky procedure in order to obtain relief.

Success rates are 80 percent in expert hands. Catheter ablation is most successful in treating paroxysmal atrial fibrillation, less successful with persistent disease, and not recommended for those with chronic atrial fibrillation.

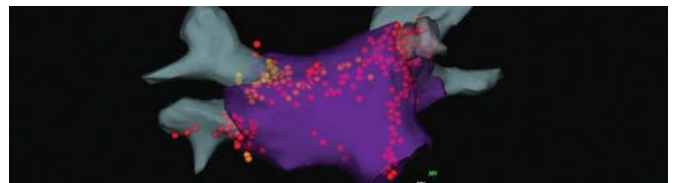
Jaffe uses high-resolution fluoroscopy as well as mapping catheters and three-dimensional reconstruction software that provides real-time working images of the heart, ensures more precise navigation to the target area, and helps identify and protect critical anatomic structures during the procedure. He also uses intracardiac echocardiography (ICE) technology to guide the transseptal punctures.

The first objective is to identify all the pulmonary veins and, using a radiofrequency probe – which delivers a well-titrated, well-controlled dose of energy – to create small scars at the junction of the left atrium and the pulmonary veins to electrically isolate the pulmonary veins. In addition, there are sometimes aberrant foci in the left atrium that must be identified and ablated.

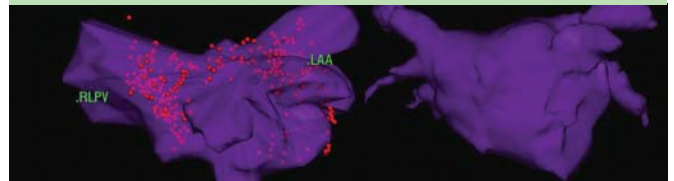
Jaffe noted, “These procedures are relatively challenging and lengthy and sometimes must be repeated in order to ablate abnormal foci that were not previously detected or treated. However, for carefully selected patients, catheter ablation can be an attractive therapy to relieve or reduce symptoms and restore quality of life.”

Cardiac Resynchronization

Cardiac resynchronization, or bi-ventricular pacing, benefits many patients with congestive heart failure who do not respond to medical therapy. Percutaneous placement of pacing electrodes on the sides of the left ventricle restores a synchronous heart beat, enhances cardiac function, improves mitral insufficiency, and confers significant quality-of-life benefits.



➤ Successful afib ablation map with left atrium in purple and pulmonary veins in blue.



➤ Left atrial map generated in EP Lab as compared with guiding CT scan on right.

Prophylactic ICD Placement

Prophylactic placement of an implantable cardioverter defibrillator (ICD) has become a valuable therapy for patients with advanced heart disease who are at risk for ventricular fibrillation and sudden cardiac death. National multi-center trials have demonstrated that prophylactic ICD placement benefits patients with coronary artery disease and heart failure, as well as those with non-ischemic cardiomyopathy and heart failure.

Physicians who wish to inquire about catheter ablation for atrial fibrillation or about referring a patient for treatment should contact **Brian Jaffe, MD** at (231) 935-5800.


New Approaches to Cardiac Surgery

Cardiac surgeons at Munson Medical Center (MMC) are defining the future of cardiac surgical care with new approaches to quality improvement and to collaborative, patient-centered care, as well as adoption of innovative surgical techniques.

Model Quality Improvement Initiative

In 2000 and 2001, under the direction of Munson cardiac surgeon **Daniel H. Drake, MD**, then president of the Michigan Society of Thoracic and Cardiovascular Surgeons, and **Richard Prager, MD**, a cardiac surgeon at the University of Michigan, the Society developed an innovative surgical quality improvement program that has since become a national model.



 Cardiothoracic Surgeon R. Glade Smith, MD, meets with family members following surgery.

Drake and Prager believed that the data the Society was already collecting from member institutions could be better used to help surgeons and hospitals analyze and improve their practices and

their patient outcomes. They instituted a program whereby data was unmasked, that is, reported by institution, and in some cases, by surgeon. Outcomes-related data including mortality, risk-adjusted mortality, infection, excessive bleeding, prolonged ventilation, stroke, renal failure, and readmission to the hospital, was analyzed and reported four times per year, and member institutions met to examine the data and discuss any opportunities for institutional and individual practice improvement.

Over the intervening years, the program has continued to develop and provide opportunities for quality improvement. For any category, mortality, for example, all institutions are compared against the national mean and the Michigan mean. Programs that compare most unfavorably with national and state norms are asked to fill out for each patient treated in the last year an evidence-based form detailing known risk factors for specific adverse outcomes.

These forms are then analyzed to identify practices that might contribute to adverse outcomes, affording an opportunity for institutions to change practices and potentially improve patient outcomes. Also, programs with average and high rates of adverse outcomes invite programs with better profiles to visit and make recommendations for improvement.

The program was described in the February 23, 2006 edition of *New England Journal of Medicine* as a national prototype for the pay-for-participation model for quality improvement.

Drake said, “This quality improvement program has proved to be a productive endeavor; it translates directly into saved lives.”

Physicians Collaborative on Cardiovascular Care

Another innovation in patient care is the continuing focus on collaborative cardiac surgical care. Many cardiac conditions that once required surgery can now be successfully treated through less invasive approaches, and the key to offering the best therapeutic strategy for each patient is a collaborative, multidisciplinary approach to care. Thus Munson’s cardiac surgeons are working closely with interventional cardiologists, interventional radiologists, and vascular surgeons to provide the most appropriate care for patients with cardiovascular disease.

Drake said, “Clinicians in all these disciplines bring unique knowledge bases and skill sets to patient care. Working together and drawing on the multidisciplinary strengths of the group, we can identify and implement the best treatment strategy for each individual patient.”

Excellent Cardiac Results

Munson’s cardiac surgeons offer a full range of conventional and less invasive therapies, including:

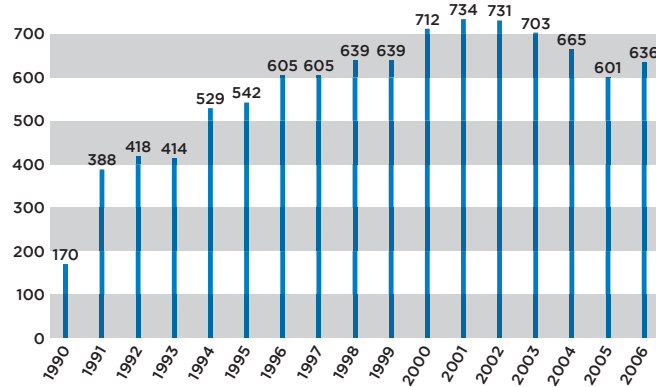
- Revascularization – coronary artery bypass, carotid endarterectomy, and off-pump CABG for selected patients
- Ventricular restoration – Dorr and TRI SVR procedures
- Circulatory assist – VAD implantation as bridge-to-transplant therapy
- Cardiac arrhythmia surgery – conventional and modified MAZE
- Valve repair and replacement, including less invasive approaches for appropriately selected patients
- Aortic repair
- Correction of congenital cardiac defects
- Resection of cardiac tumors
- Correction of post-infarction ventricular septal defects

Drake noted, “As we strive to offer advanced and minimally invasive procedures when they are appropriate, our outcomes remain excellent. Risk-adjusted mortality and complication rates are better than national averages and continue to improve, and the cardiac surgery service regularly receives national recognition for excellence in coronary artery bypass surgery and valve replacement surgery.”

Munson Cardiothoracic Surgery Volumes/Outcomes

Major Cardiac Operations - Volume

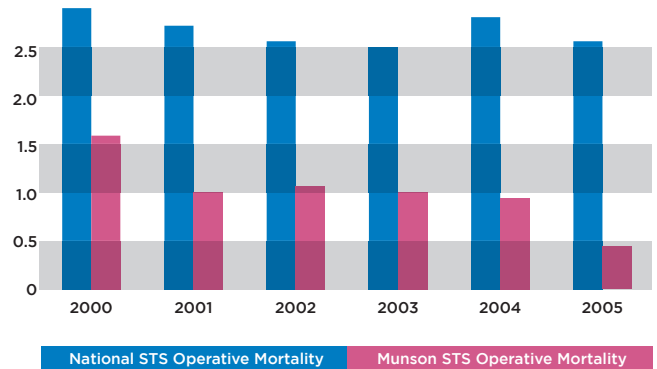
High-volume open heart centers are associated with improved surgical outcomes.



Major Cardiac Operations - Mortality

All Cardiac Surgical Procedures Risk Adjusted Operative Mortality

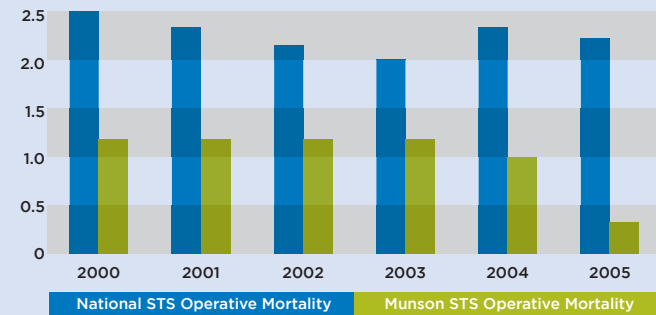
Munson's cardiac surgical results are excellent and compare favorably to nationally recognized programs.



Coronary Bypass Grafting

Isolated Coronary Bypass Risk Adjusted Operative Mortality

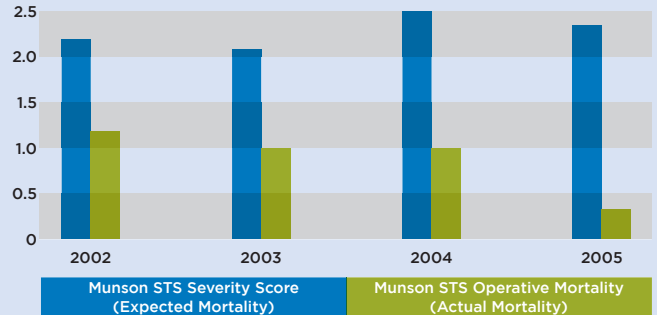
Outcomes for coronary bypass grafting including re-operation are consistently superior to regional and national results.



Severity Score and Mortality

Isolated Coronary Bypass Severity Score and Mortality

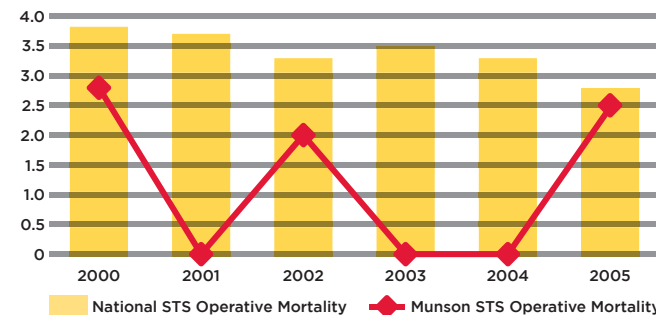
Despite an increasing severity score, Munson's mortality rates continue to decline.



Aortic Valve Replacement

Isolated Aortic Valve Replacement Mortality

The national operative mortality from 2000 - 2005 was a 3.4%, while Munson's was only 1.2%.



Mitral Valve Repair

Isolated Mitral Valve Repair Mortality

Mitral valve repair provides superior initial and long-term results when compared to replacement. Munson had **no** operative mortality from 2000 - 2005.

